

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-14 (Cancelled)

Claim 15 (Currently Amended): A method for shifting a refined microstructure of a metallic material, comprising:

solidifying a molten metallic material at temperatures lower than a liquidus of the molten metallic material; and

vibrating the solidifying molten metallic material by applying an alternating electric current and a magnetic field simultaneously to the solidifying metallic material at a current value and a Tesla value configured to crush solid crystal particles of the solidifying metallic material into small pieces; and

shifting the small pieces to a periphery of a cylindrical tube or container ~~by~~ with said alternating current and said a magnetic field using an electromagnetic coil disposed such that the electromagnetic coil envelops the metallic material set at a current value and a Tesla value configured to yield-concentrate said refined microstructure of the metallic material ~~concentrated~~ in the periphery of the cylindrical tube or container.

Claims 16-17 (Canceled)

Claim 18 (Previously Presented): The method of Claim 15, wherein the applying further comprises applying the electric current and the magnetic field during last stages of solidifying of the solidifying metallic material.

Claim 19 (Canceled)

Claim 20 (Currently Amended): The method of Claim 15, wherein the ~~shifting~~
~~comprises alternating a stationary magnetic field using theis generated with an~~
~~electromagnetic coil disposed such that the electromagnetic coil envelops~~enveloping the
metallic material.

Claim 21 (Currently Amended): The method of Claim 15, wherein ~~the shifting~~
~~comprises shifting the small pieces to an end portion of the metallic material in the~~
~~cylindrical tube or container~~ said current value and said Tesla value configured to crush solid
crystal particles comprises:

a current value less than a current value used to melt said metallic material.

Claim 22 (New): The method of Claim 15, wherein said current value and said Tesla
value configured to concentrate said refined microstructure comprises:

a Tesla value of 1.4 Tesla.

Claim 23 (New): The method of Claim 15, wherein said metallic material is Al-Si
alloy and said small pieces have a crystal grain diameter between 0.5 and 3 μm .

Claim 24 (New): The method of Claim 15, wherein said metallic material is Al-Si
alloy with silicon carbide particles dispersed therein and said small pieces comprise small
silicon carbide particles having a crystal grain diameter between 0.1 and 2 μm .

Claim 25 (New): The method of Claim 15, further comprising:

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concentrating said metallic material in an end portion of said metallic material by
moving the metallic material within the magnetic field.